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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,786	08/29/2003	Dongshan Fu	007291.P029	3402
56920	7590	10/04/2006	EXAMINER	
ACCURAY/BLAKELY 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030				KAO, CHIH CHENG G
ART UNIT		PAPER NUMBER		
		2882		

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/652,786	FU ET AL.	
	<b>Examiner</b> Chih-Cheng Glen Kao	<b>Art Unit</b> 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 11 July 2006.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-49 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 21-37 and 44-49 is/are allowed.
- 6) Claim(s) 1-20 and 38-43 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 08 March 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date: _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/12/06</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Allowable Subject Matter***

1. The indicated allowability of claims 1-20 and 40-43 are withdrawn in view of 35 U.S.C. 101. Rejections are as follows.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-20 and 38-43 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims are directed toward a computer implemented method involving computational data. The data is generated within a computer without a physical manifestation. Thus, these claims do not produce a result which meet the standard of being concrete, tangible, and useful.

The claims must be for a practical application of the abstract idea, law of nature, or natural phenomenon. See Diehr, 450 U.S. at 187, 209 USPQ at 8 (“application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection”) and Benson, 409 U.S. at 71, 175 USPQ at 676 (rejecting formula claim because it “has no substantial practical application”).

To satisfy section 101 requirements, the claim must be for a practical application of the 101 judicial exception, which can be identified in various ways:

1) The claimed invention “transforms” an article of physical object to a different state or thing.

2) The claimed invention otherwise produces a useful, concrete, and tangible result, based on the factors discussed in MPEP 2106. See also:  
[http://www.uspto.gov/web/offices/pac/dapp/ola/preognitice/guidelines101\\_20051026.pdf](http://www.uspto.gov/web/offices/pac/dapp/ola/preognitice/guidelines101_20051026.pdf).

The manipulation of data for determining a difference in images is performed by the computer implementing programs and is therefore nonstatutory subject matter. Manipulation of data does not include a physical transformation outside of a computer or representation thereof. A process consisting solely of computer operations does not manipulate appropriate subject matter, is not deemed to be concrete, tangible, and useful, and is therefore non-statutory.

An example which would make the instant method steps of claims 1-20 statutory would be to include a step of correcting patient position or aligning a radiation beam based on the determined value of said in-plane transformation parameters ( $x,y,\theta$ ) and said out-of-plane rotational parameters ( $r,\phi$ ). An example which would make the instant method steps of claims 38-43 statutory would be to include a step of correcting patient position or aligning a radiation beam based on the determined difference between the present orientation of the target volume and the previous orientation of the target volume. Hence, the data would become concrete, tangible, and useful.

#### *Allowable Subject Matter*

3. Claims 21-37 and 44-49 are allowed. The following is a statement of reasons for the indication of allowable subject matter.

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4. Regarding claim 21, prior art fails to disclose or fairly suggest a system for registering at least one 2D radiographic image of a target with at least one image reconstructed from previously generated 3D scan data of said target, including software for determining a set of in-plane transformation parameters ( $x,y,\theta$ ) and out-of-plane rotational parameters ( $r,\phi$ ), said in-plane and out-of-plane parameters representing a difference in a position of the target as shown in said radiographic image as compared to the position of the target as shown by a 2D reconstructed image, wherein said software comprises means for performing a 3D multi-level matching to determine an initial estimate for said in-plane transformation parameters ( $x,y,\theta$ ), in combination with all the limitations in the claim. Claims 26-37 contain allowable subject matter by virtue of their dependency.

5. Regarding claim 44, prior art fails to disclose or fairly suggest a system, including a controller coupled with a radiation source, imaging system, and a 3D scan data generator, the controller configured to determine a difference between a present orientation of a target volume and a previous orientation of the target volume in three translational coordinates and three rotational coordinates by comparing in-plane transformation parameters and out-of-plane rotation parameters of 2D radiographic images and reconstructed 2D reference images in a first image plane and a second image plane, wherein to determine said difference the controller is configured to search the in-plane transformation parameters in the first image plane and the second image plane using a first similarity measure between the 2D radiographic images and the reconstructed 2D reference images in a 3-dimensional multi-level search, in combination with all

the limitations in the claim. Claims 45-49 contain allowable subject matter by virtue of their dependency.

***Response to Arguments***

6. Applicant's arguments with respect to claims 1-20 and 38-43 have been considered but are moot in view of the new ground(s) of rejection.

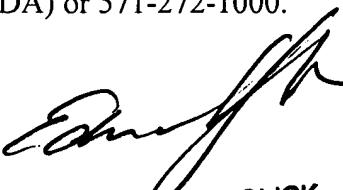
***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
gk

  
EDWARD J. GLICK  
SUPERVISORY PATENT EXAMINER